Nalco Docket No.: 7726-NES
Customer No. 000049459

REMARKS

This is in reply to the Office Action mailed on July 18, 2006 ("Office Action").

Claims 1-32 are currently pending.

Claims 1,2, 4-8, 12-17, 19, 20, 29 and 31 are rejected under 35 U.S.C. § 102(e) over U.S. Patent 6,569,983 ("Treybig").

Claims 1, 3, 10 and 11 are rejected under 35 U.S.C. § 102(b) over U.S. Patent 4,396,499 ("McCoy").

Claims 26, 27 and 28 are rejected under 35 U.S.C. § 102(b) over U.S. Patent 5,760,108 ("Arora").

Claims 21 and 22 are rejected under 35 U.S.C. § 103(a) over U.S. Patent 6,569,983 ("Treybig") in view of U.S. Published Patent Application No. 2003/0008781 ("Gupta").

Claim 30 is rejected under 35 U.S.C. § 103(a) over U.S. Patent 6,569,983 ("Treybig") in view of U.S. Patent No. 4,830,827 ("Au").

Claims 23 and 24 are rejected under 35 U.S.C. 103(a) over U.S. Patent 6,569,983 ("Treybig") in view of U.S. Patent 5,779,405 ("Bruhnke").

Claims 18 and 32 are rejected under 35 U.S.C. § 103(a) over U.S. Patent 6,569,983 ("Treybig").

Claims 29 and 31 are rejected on the ground of nonstatutory obviousness-type double patenting over claims 1, 2, 8 and 9 of U.S. Patent No. 6,569,983.

Claims 1, 23, 29, 31 and 32 are amended to particularly point out and distinctly claim subject matter which Applicant regards as his invention. Support for this amendment is found in the specification at page 13, lines 26-27.

No new matter is added by this amendment.

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DISCUSSION

The Rejection of Claims 1, 2, 4-8, 12-17, 19, 20, 29 and 31 under 35 U.S.C. § 102(e) over U.S. Patent 6,569,983

Claims 1, 2, 4-8, 12-17, 19, 20, 29 and 31 are rejected under 35 U.S.C. § 102(e) over U.S. Patent 6,569,983 ("Treybig"). In particular, the Examiner states:

> The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.
>
> Treybig discloses a composition for recovering hydrocarbon fluids from a subterranean reservoir. Said composition comprises a branched polyhydroxyetheramine prepared by reacting an amine having two reactive hydrogen atoms with a diepoxide followed by an N-alkylating agent (abstract, Claim 1), said amine can have alkylene oxide functionality (figure g depicts an amine with 2 active hydrogens and alkylene oxide units in its backbone). This amine alone meets the requirements of the polyhydroxyetheramine composition of Claim 1 and the reaction meets the requirements of Claim 29. Without knowing the molecular weight of the polyhydroxyetheramine it is impossible for the Examiner to calculate the weight percent of applicants vs. the volume % disclosed by '983, however since the solvent is water and only 2000 ppm of active material, or polyhydroxyetheramine, is disclosed to be used for treatment (Column 14 line 13) Examiner finds the volume percent of 0.005 to 2 to overlap with a weight percent of 0.005 to 2., thus meeting all the limitations for Claim 1.
>
> The use of diglycidyl esters of diacids for the diepoxide is disclosed in Column 3 Line 3, meeting the requirements for Claim 2, the alkylene oxide functionalized amines are disclosed in figures b, c, f and g (Column 4 and 5), meeting the requirements for Claim 4, the amines having 2 reactive hydrogen atoms are found in figures a, d and e, as required for Claim 5. R, R2 and Z are disclosed in Column 5 Lines 49-52, meeting the requirements for Claim 6. The amine having 2 reactive hydrogen atoms is further disclosed in Column 5 Lines 53 to Column 6 Line 5, meeting the requirements Claim 7, the diglycidyl esters of diacids are disclosed in Column 6 Lines 9-19, meeting the requirements for Claim 8, the use of diglycidyl ether of neopentyl glycol and glycerol are disclosed in Column 3, Line 33-35, meeting the requirements for Claims 12 and 13. The use of 1,2,3,4 diexpoxybutane is disclosed in Column 3 Line 53, as required for Claim 14, the use of diglycidyl ether of dimer acid is disclosed in Column 3 Line 3 as required for Claim 15, the use of

secondary, tertiary and ditertiary amines are disclosed in Column 6 Line 25-29, as required for Claim 16.

Reacting a polyhydroxyetheramine (which has substituents of alkylene oxide and 2 reactive hydrogen groups as shown in figures a-g) with a diepoxide and then reacting that product with an amine having 1 or 2 reactive hydrogen atoms is disclosed in Claim 9 of '983, meeting the requirements for Claims 17 and 31. The use of a mixture of diepoxides and aliphatic or aromatic triepoxides is disclosed in Column 6 Lines 20-24, as required by Claim 19 and the use of an alkylating agent after the reaction of the amine and the mixture of the epoxides is disclosed in Claim 10 of '983, as required for Claim 20.

Office Action at pages 2-4.

Applicant respectfully traverses this rejection.

Applicant respectfully asserts that Treybig discloses a branched polyhydroxyetheramine prepared by reacting an amine having two reactive hydrogen atoms with a diepoxide to form a polyhydroxyethereamine and then reacting the polyhydroxyetheramine with an N-alkylating agent to prepare the branched polyhydroxyetheramine. The N-alkylating agent is a compound of formula $R_{11}X$ where R_{11} is C_5-C_{25} alkyl or alkenyl where the alkyl or alkenyl is optionally substituted with one or more oxygen atoms. Col. 3, line 65 to col. 4, line 16.

The polymer used in the recited method is a water-soluble alkylene oxide branched polyhydroxyetheramine or a salt thereof, wherein the alkylene oxide branched polyhydroxyetheramine is prepared by reacting a diepoxide with one or more alkylene oxide functionalized amines and one or more amines having two reactive hydrogen atoms and optionally reacting the resulting polyhydroxyetheramine with an acid or alkylating agent of formula $R_{14}X$ where R_{14} is C_1-C_4 alkyl and X is halogen, sulfate or sulfonyl to form the salt. See claim 1.

As noted by the Examiner, the diepoxide can read on the diepoxide of Treybig and the alkylene oxide functionalized amines and amines having two reactive hydrogen atoms on the amine having two reactive hydrogen according to Treybig.

The polymer of this invention, however, does not comprise the reaction product of the polyhydroxyetheramine with an N-alkylating agent as disclosed by Treybig. In order to further differentiate the optional salts of the polymer of this invention from the polymer of Treybig, Applicant has amended claim 1 to recite that the salts are prepared from an acid or an alkyl halide of formula R_{14} is C_1-C_4 alkyl and X is halogen, sulfate or sulfonyl.

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Accordingly, as Treybig discloses a different polymer than the polymer of this invention, Applicant respectfully requests withdrawal of the rejection of claims 1, 2, 4-8, 12-17, 19, 20, 29 and 31 under 35 U.S.C. § 102(e) over Treybig.

The Rejection of Claims 1, 3, 10 and 11 under 35 U.S.C. § 102(b) over U.S. Patent 4,396,499

Claims 1, 3, 10 and 11 are rejected under 35 U.S.C. § 102(b) over U.S. Patent 4,396,499 ("McCoy"). In particular, the Examiner states:

> McCoy discloses a demulsifier for subterranean formations (abstract and Column 1 Lines 22-25). Said demulsifier is prepared by the reaction between polyoxyalkylene diamines and diepoxides. The polyoxyalkylene diamine can be a JEFFAMINE as in Example 1, which has both alkylene oxide moieties and an amine with 2 reactive hydrogens. Use of a 1 wt% of the demulsifier is used as disclosed in Example X1, thus meeting the requirements for Claim 1. The diepoxide is disclosed in Column 2 Line 44 to be diglycidyl ether of Bisphenol A, meeting the requirements for Claims 3, 10 and 11.
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> Office Action at page 4.

Applicant respectfully traverses this rejection.

Applicant respectfully asserts that the polymer of this invention is the result of the reaction product of at least three components: (1) a diepoxide; (2) one or more alkylene oxide functionalized amines; and (3) one or more amines having two reactive hydrogen atoms. The polymer according to McCoy does not incorporate the amine having two reactive hydrogen atoms.

Applicant further respectfully asserts that the JEFFAMINE of Example 1, cited by the Examiner, does not fit the definition of either an alkylene oxide functionalized amine because it has four reactive N-H groups rather than two, specification at page 3, lines 10-15, or the definition of an amine having two reactive hydrogen atoms because it has four reactive hydrogen atoms rather than two and contains the alkylene oxide functionality which the amine having two reactive hydrogen atoms does not, specification at page 3, lines 16-23. Applicant respectfully asserts that a polymer prepared from a single amine having both two reactive hydrogen atoms and alkylene oxide functionalization as suggested by the Examiner is per se different from a polymer prepared from two

different amines, only one of which contains the alkylene oxide functionalization and both of which contain two reactive hydrogen atoms.

Accordingly, as McCoy discloses a different polymer than the polymer of this invention, Applicant respectfully requests withdrawal of the rejection of claims 1, 3, 10 and 11 under 35 U.S.C. § 102(e) over McCoy.

The Rejection of Claims 26, 27 and 28 under 35 U.S.C. § 102(b) over U.S. Patent 5,760,108

Claims 26, 27 and 28 are rejected under 35 U.S.C. § 102(b) over U.S. Patent 5,760,108 ("Arora"). In particular, the Examiner states:

> Arora discloses a curable epoxy resin ester 35-45% resin ester and 25-35% each of water and organic cosolvent (Column 14 Lines 45-49). The resin ester is an amine-epoxy adduct with a polyhydric phenol and epoxy resin (Column 13 Lines 7-8) and the use of polyoxyalkyleneamines is disclosed in Column 6 Lines 14-Column 9 Line 47. A polyoxyalkyleneamine having alkylene oxide adducts and 2 reactive hydrogen atoms is disclosed in column 8 Line 56. The cosolvent stabilizes the dispersion of the resin (Column 13 Line 43) and can include the use of dipropylene glycol butyl ether (Column 13 Line 62), as required for Claims 26-28.
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> Office Action at page 5.

Applicant respectfully traverses this rejection.

Applicant respectfully asserts that Arora discloses curable epoxy resin esters prepared by:

I. reacting (a) an epoxy resin, (b) a polyhydric phenol, and (c) an amine-epoxy adduct, wherein the amine-epoxy adduct is formed upon contacting an aliphatic polyepoxide and a polyoxyalkyleneamine.

II. reacting (a) an epoxy resin with (b) a polyoxyalkyleneamine; or

III. reacting (a) an epoxy resin, (b) an amine-epoxy adduct, and optionally (c) a polyhydric [illegible] amine-epoxy adduct is prepared as described above. Col. 4, line 43 to col. 5